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Understanding the relations of perceived infectability with physical and mental health: A meta-analysis

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Abstract

Perceived infectability is the self-assessed likelihood of illness, and its relations with physical and mental health play a pivotal role in many models and theories; however, no quantitative review has summarized these relations, which poses significant barriers to the progression of empirical research, and theoretical development. Variability in these relations may cause authors to habitually draw from atypical results, and study-level influences on these relations may remain undiscovered. The current article resolves these tensions by reporting a meta-analysis of 103 sources. We demonstrate that perceived infectability produces negative, moderate, and statistically significant relations with both physical health and mental health. Our results also support some study-level influences while failing to support others, indicating that our findings provide clear avenues for pursuing fruitful research while avoiding those with less potential. Our discussion advances theory by integrating these results, and we guide researchers toward crafting more specific hypotheses regarding these relations.

Keywords

perceived infectability, behavioral immune system, health, meta-analysis, disease avoidance

Introduction

Perceived infectability is the self-assessed likelihood of illness, and it is a pivotal construct in models and theories associated with physical and mental well-being (Makhanova et al., 2022; Safra et al., 2021; Whelan and Hingston, 2024). Research has repeatedly investigated antecedent effects of perceived infectability, discovering that physical well-being is a primary contributor to whether people perceive themselves as susceptible to illness (Ding and Luo, 2022; Magallares et al., 2015; Makhanova et al., 2022). Healthier people tend to view themselves as more resilient. In turn, people with greater perceived infectability are more

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Data Availability Statement included at the end of the article likely to perform preventive behaviors to shield themselves from illness, indicating that perceived infectability has a strong influence on the behavioral immune system (Ding and Luo, 2022; Stangier et al., 2022; Yahaghi et al., 2021). At the same time, research has supported that perceived infectability tends to produce a negative relation with mental health (Airoldi et al., 2022; Bailey and Wells, 2016; Stangier et al., 2022). People who view themselves as vulnerable to illness tend to experience more anxiety and depression, perhaps because they are habitually stressed by their potential for infection (Alberts and Hadjistavropoulos, 2014; Church et al., 2022; Sica et al., 2021). For this reason, a significant swath of research investigated whether perceived infectability contributed to poorer mental health during the COVID-19 pandemic, as people focused more on their risk of illness during this period (Airoldi et al., 2022; Church et al., 2022; Sica et al., 2021).

Despite significant advances in the literature, no quantitative review has summarized the relations of perceived infectability with physical and mental health, which poses significant barriers to the progression of empirical research, and theoretical development. Variability has been observed regarding the relation of perceived infectability with both physical and mental health, and study results range from positive to non-significant to negative (Airoldi et al., 2022; Ding and Luo, 2022; Makhanova et al., 2022; Sica et al., 2021). Currently, authors must derive arguments from specific study results, rather than holistically drawing from aggregated averages that summarize entire bodies of research. Because variability is evident in prior research, researchers may be habitually drawing from atypical results, hampering the development of theory. Perhaps more important, researchers cannot model between-study variance in individual empirical investigations. Instead, a quantitative review must be conducted to model the effect of study-level predictors on the relations of perceived infectability with physical and mental health, such that the variability in observed effects can be explained. Many study-level influences may remain undiscovered because no quantitative review exists, further hampering the development of theory. Therefore, only by performing this investigation can a more complete understanding be obtained of perceived infectability, physical health, and mental health.

We resolve these tensions in the literature by performing a meta-analysis of the relations between perceived infectability with physical and mental health. We utilize multiple search procedures to obtain an initial list of over 10,000 sources, and we undergo a systematic coding process to arrive at a final list of 103 sources. Our analyses provide overall estimates for the relation of perceived infectability with physical and mental health, and the significant variability in these relationships suggests the presence of moderating effects. We then perform meta-regression analyses to determine whether several study characteristics significantly influence these relations, including the applied outcome measure, the studied population, and whether the study was performed before or after COVID-19. Our results support some of our hypothesized effects while failing to support others, indicating that our findings provide clarity for future researchers to pursue more fruitful avenues while avoiding those with less potential.

By performing this meta-analysis, we provide several contributions to research and practice. First, providing quantitative summaries for the relation of perceived infectability with physical and mental health enables future researchers to base their arguments and theorizing on robust estimates rather than specific study results, ensuring that accurate perspectives are proliferated throughout the literature. Second, testing whether certain study characteristics influence the studied relations provides assessments of relevant theoretical perspectives. Notably, by assessing whether studies performed before or after COVID-19 produce stronger relations, we provide inferences regarding whether perceived infectability is even more central to models and theories associated than presently assumed. If true, then current knowledge on perceived infectability would need to be revised to account for its heightened influence. Third, by investigating whether certain aspects of study design (e.g. measures and samples) influence results, we enable future researchers to set more realistic expectations regarding the magnitude of their results, which can provide stronger tests of hypotheses. As authors have called for the creation of more precise hypotheses across all domains of research (Hopkins, 2022; Murphy and Myors, 1999; Newman, 2008), we provide an opportunity for future researchers to heed these calls when investigating the relations of perceived infectability with physical and mental health.

Background

Perceived infectability and behavioral immune system

Perceived infectability is a conscious evaluation of personal vitality (Duncan et al., 2009; Shook et al., 2020; Tybur et al., 2014). While the construct is associated with a multitude of theoretical perspectives, it is regularly studied in the context of the behavioral immune system, which refers to automatic cognitive, and behavioral processes that cause people to avoid infectious stimuli (Ackerman et al., 2018; Schaller and Duncan, 2011; Schaller and Park, 2011). Theories associated with the behavioral immune system propose that these processes are triggered by observing potentially infectious stimuli, such as rotten food or dead bodies. The behavioral immune system then generates emotional and cognitive responses, with among the most central and powerful being disgust (Lieberman and Patrick, 2014; Schaller, 2014; Tybur et al., 2010). These cognitions and behaviors cause people to instinctively retract from the potentially infectious pathogen, reducing the likelihood of illness and improving fitness.

Compensatory theoretical perspectives (Ackerman et al., 2018; Miller and Maner, 2011; Oaten et al., 2017) further argue that the behavioral immune system compensates for the biological immune system. That is, the behavioral immune system is an evolutionary mechanism that improves fitness because the biological immune system is not protective enough in certain circumstances, especially those that elicit disgust. These perspectives continue to argue that the behavioral immune system is stronger for those with weaker biological immune systems due to this evolutionary compensation mechanism, as those with weaker biological immune systems more strongly require this protection of the behavioral immune system to survive (Ackerman et al., 2018; Miller and Maner, 2011; Oaten et al., 2017). In associated studies, authors often use perceived infectability as an indicator of biological immune system strength, causing it to be central to theories associated with the behavioral immune system (Gassen et al., 2018; Hlay et al., 2024; Makhanova et al., 2022; Terrizzi et al., 2014). While a conscious perception, perceived infectability partially emerges from actual infectability, and it is the most common approach to assessing infectability – whether perceived or actual (Duncan et al., 2009; Schaller and Park, 2011; Shook et al., 2020; Tybur et al., 2014). In turn, researchers model perceived infectability as an antecedent effect to behavioral immune system strength via compensatory mechanisms suggested by relevant theories (Ackerman et al., 2018; Miller and Maner, 2011; Oaten et al., 2017). Therefore, many authors have argued that understanding the role of perceived infectability is essential to understanding the behavioral immune system (Gassen et al., 2018; Hlay et al., 2024; Makhanova et al., 2022).

At the same time, some authors have questioned the role of perceived infectability in the behavioral immune system (Howard et al., 2026; Shook et al., 2020). These authors argue that the behavioral immune system operates automatically, separate from cognitive awareness. For this reason, perceived infectability may not serve an active role in the behavioral immune system, and it may instead be a common outcome of actual infectability. That is, actual infectability may produce both behavioral immune system responses and perceived infectability, whereas neither outcome is directly associated with the other beyond being outcomes of a common antecedent. Via this perspective, perceived infectability is not a component of the behavioral immune system, but it nevertheless serves important purposes due to its relation to both physical and mental well-being – and relevance to other associated theoretical perspectives.

Measurement of perceived infectability

Perceived infectability is most frequently measured via the Perceived Vulnerability to Disease Questionnaire (PVDQ; Park et al., 2003), which is a self-report measure that assesses, "beliefs about personal susceptibility to the transmission of infectious diseases and emotional discomfort in the presence of potential disease transmission" (Duncan et al., 2009: 541). The scale includes two dimensions, perceived infectability and germ aversion, wherein the latter represents the tendency to avoid pathogenic stimuli. For instance, an example germ aversion item is, "I do not like to write with a pencil someone else has obviously chewed on" (Duncan et al., 2009: 542). When applying the PVDQ, authors most often aggregate scores for the two constructs together in analyses, using the total score to represent general beliefs about personal susceptibility to pathogenic stimuli (Howard et al., 2026; Shook et al., 2020; Tybur et al., 2014).

While a multitude of studies have applied the PVDQ, a growing number of authors have recognized that the two dimensions produce notably different relations with potential antecedents and outcomes (Chiesi et al., 2022; Do Bú et al., 2023; Ferreira et al., 2022). These observations raise questions about whether perceived infectability and germ aversion should be aggregated together, as the two constructs represent different aspects of the behavioral immune system. Perceived infectability is a conscious perception of vitality, and it is believed to influence behavioral responses to infectious stimuli due to compensatory mechanisms; whereas germ aversion is a habitual behavioral response to infectious stimuli, and it is an outcome of the behavioral immune system (Do Bú et al., 2023; Duncan et al., 2009; Ferreira et al., 2022). Due to their different natures, extant research aggregating the two dimensions together may produce unclear inferences regarding the role of perceived susceptibility to illness in relevant theories and frameworks. Therefore, studies that place a sole focus on one construct or the other can produce more accurate insights regarding the nature of either perceived infectability or germ aversion.

In the current article, we perform a focused investigation on perceived infectability to specifically investigate the self-assessed likelihood of illness, such that our results can inform future research regarding its placement in relevant theories and frameworks. Via this approach, we ensure that our meta-analytic findings produce accurate insights, as our results do suffer from construct contamination with germ aversion. Therefore, we advance current narratives in the literature on perceived infectability by adhering to the recommendations of prior authors.

It should also be recognized that authors have also used alternative measures of perceived infectability, including their own created measures (Chao et al., 2012; Sattler et al., 2025; Wang and Li, 2015). Findings from these studies may have been overlooked in prior articles that only discuss investigations utilizing the PVDQ. In the current article, we include results obtained from these alternative measures within our meta-analytic database and analyses. By doing so, we ensure that the entire scope of literature investigating perceived infectability is represented in our meta-analysis, alleviating potential concerns regarding an overreliance on specific measurement approaches. Including these studies also ensures that the current results can speak to a wider range of literature investigating the relation of perceived infectability and well-being.

Physical health and perceived infectability

Direct effect. Physical health relates to cognitive and emotional processes (Latino and

Tafuri, 2024). For example, chronic pain patients often experience significant changes in cognition and emotion, including memory, executive functioning, and decision-making (Leavitt and Katz, 2006; Moriarty et al., 2011). Given these established relations, we assert that physical health is related to perceived vulnerabilities to illness. When one continuously experiences symptoms that significantly impact their physical health and quality of life over time, they may begin to associate these triggers with potential future experiences of vulnerability to illness and decreased health. Past findings indicate that specific health conditions (e.g. irritable bowel syndrome, cancer) are associated with heightened vulnerability to illness (Crane and Martin, 2002; Slivjak et al., 2021).

Further, the behavioral immune system framework proposes that people engage in specific cognitive and emotional processes to avoid infectious stimuli, and certain people exhibit heightened sensitivities and stronger reactions to these stimuli (Ackerman et al., 2018; Schaller and Park, 2011). Authors have suggested that people with worse physical health may have stronger behavioral immune systems, as their heightened sensitivities and stronger reactions may serve as compensatory mechanisms (Ackerman et al., 2018; Schaller and Duncan, 2011). Perceived infectability is a key component of the behavioral immune system, as perceptions of susceptibility may influence the extent that people retract from infectious stimuli. Given the influence of physical well-being on the behavioral immune system and the centrality of perceived infectability within the behavioral immune system, physical well-being is expected to influence perceived infectability. Based on these two streams of research, we propose that physical health is negatively related to perceived infectability.[1]

> **Hypothesis 1:** Physical health is negatively related to perceived infectability**.**

Moderating effects. The COVID-19 pandemic heightened people's awareness of their physical health and potential for infection (García-Esquinas et al., 2021; Hu et al., 2022; Kauhanen et al., 2023; Yoo et al., 2021). Quarantining, face mask wearing, and other preventive behaviors were constant reminders regarding the threat of infection, and the outgrowth of research on perceived infectability during this time is a clear indicator that people were more cognizant of their physical health and likelihood to become ill (Pierce et al., 2020; Robinson et al., 2022; Sun et al., 2023). We suggest that this heightened awareness strengthened the relation between physical health and perceived infectability.[2] That is, people have long based their perceived infectability on their well-being, causing physical health to negatively relate to perceived infectability; however, the COVID-19 pandemic caused people to become hyper-aware of their physical well-being, perhaps causing them to base their perceived infectability more strongly on their own physical health. Based on this rationale, we propose that the relation of physical health and perceived infectability is stronger in studies conducted during 2020 and after (i.e. post-COVID-19) relative to studies conducted before 2020 (i.e. pre-COVID-19).

> **Hypothesis 2:** The relation of physical health and perceived infectability is stronger in studies conducted during 2020 and after, compared to before 2020**.**

Empirical investigations of physical health differ regarding their operationalizations, which broadly fall into the two categories of objective and subjective measures. Objective operationalizations typically ask participants to indicate their current medical conditions, such as providing a checklist of common conditions. Even when lists are exhaustive of common conditions, participants may possess uncommon conditions that are not identified by this measurement approach. For this reason, objective operationalizations may be less likely to fully encapsulate all aspects of physical health. Alternatively, subjective operationalizations typically ask participants to respond to statements on a Likert scale format, such as asking participants about their (dis)agreement with the statement, "I am a healthy person." Subjective evaluations often represent global evaluations of physical well-being, as participants are often asked to report on their general health. These measures are more likely to provide a broad assessment of physical well-being, as participants respond regarding their overall condition.

We suggest that the relation between physical health and perceived infectability differs based on the measurement approach of the former. The relation of physical health and perceived infectability may be tempered when measured by objective measures, because these measures do not capture all detrimental influences on physical health that influence perceived infectability. For instance, checklists may fail to include certain conditions that produce strong relations with perceived infectability, reducing the magnitude of relations produced by these measures. Alternatively, because subjective evaluations can provide total assessments of physical health, this operationalization may produce a stronger relation with perceived infectability. Subjective evaluations are more capable of global assessments, capturing more aspects that may influence perceived infectability. In turn, these measures may capture a greater amount of variance in perceived infectability that produces stronger relations with perceived infectability.

Further, self-reported responses may be biased by self-perceptions relative to objective measures (Howard et al., 2024; Min et al., 2016; Podsakoff et al., 2024). That is, influences beyond actual physical well-being may impact the self-reporting of physical health, such as response tendencies, personality, or mood. These influences are likely to produce a similarly biasing effect on self-reported perceived infectability (Howard et al., 2024; Min et al., 2016; Podsakoff et al., 2024). For instance, people who score high on measures of neuroticism are more likely to provide pessimistic assessments of themselves, likely providing more extreme responses to measures of physical health and perceived infectability regardless of their actual states. Alternatively, objective measures are not painted by this biasing influence, further reducing the shared variance between these measures and perceived infectability. Given both holistic assessments and biasing influences, we propose that subjective evaluations of physical health produce stronger relations with perceived infectability than objective evaluations.

> **Hypothesis 3:** The relation of physical health and perceived infectability is stronger when the former is measured via subjective measures relative to objective measures.

Perceived infectability and mental health

Direct effect. One's perceived vulnerability to illness is a subjective and psychological experience driven by thoughts and emotions, thus suggesting relations with mental health (Myall et al., 2009; Paredes et al., 2021; Yang et al., 2023). When people experience a consistent or higher rate of perceiving themselves as susceptible to illness, this cognitive state may impact mental well-being over time. People with worse mental well-being may subsequently respond with coping mechanisms such as social isolation or compulsive behaviors (e.g. excessive handwashing), resulting in a cycle of maladaptive strategies that further deepen mental and emotional distress. Given the reciprocal relations between cognition, emotion, and behavior in conjunction with existing research indicating perceived vulnerability to illness as a predictor of depression, anxiety, and general mental well-being (Myall et al., 2009; Paredes et al., 2021; Yang et al., 2023), we propose that perceived infectability is negatively related to mental health.[3]

> **Hypothesis 4:** Perceived infectability is negatively related to mental health.

Moderating effects. Like physical health, the COVID-19 pandemic may have altered the relation of perceived infectability and mental health. COVID-19 caused people to reevaluate their susceptibility to illness, with everyday serving as a constant reminder of their vulnerability (Kauhanen et al., 2023; Pierce et al., 2020; Robinson et al., 2022; Sun et al., 2023). We suggest that this added burden caused mental well-being to be more strongly based on perceived infectability. That is, prior to COVID-19, a person's perceived susceptibility to illness may have affected their mental well-being, but it likely was not a central influence relative to other predictors, such as esteem or social satisfaction. After the COVID-19 pandemic, people may have felt that their well-being was more severely and constantly at threat due to the possibility of illness, causing their perceived likelihood of illness to more strongly relate to their mental well-being. Based on these possibilities, we propose that the relation of perceived infectability and mental health is stronger in studies conducted during 2020 and after, compared to before 2020.

> **Hypothesis 5:** The relation of perceived infectability and mental health is stronger in studies conducted during 2020 and after, compared to before 2020.

Authors have applied an array of operationalizations for mental health when studying its relationship with perceived infectability. Most often, authors apply relevant specific indicators of mental health, such as operationalizations of health anxiety (Airoldi et al., 2022; Alberts and Hadjistavropoulos, 2014; Bailey and Wells, 2016). Many authors also apply general indicators of mental health, such as operationalizations of general depression, anxiety, and stress (Church et al., 2022; Sica et al., 2021; Stangier et al., 2022). Least often, authors apply irrelevant specific indicators of mental health, such as operationalizations of social anxiety (Chiesi et al., 2022; Church et al., 2022; Murray et al., 2023). We suggest that the relation of perceived infectability and mental health varies based on the applied operationalization.

The bandwidth-fidelity dilemma is a known phenomenon, wherein narrow constructs produce stronger relations with relevant outcomes than broad constructs; however, broad constructs produce stronger relations with a wider range of outcomes (Hogan and Roberts, 1996; Salgado, 2017). In other words, narrow constructs may be expected to produce strong relations with relevant outcomes and small relations with irrelevant outcomes, whereas broad constructs may be expected to produce moderate relations with all outcomes. We propose that the bandwidth-fidelity dilemma may partially explain the relations between perceived infectability and mental health. Perceived infectability may be expected to produce large relations with relevant specific indicators of mental health, as they are narrow and relevant outcomes; perceived infectability may be expected to produce moderate relations with general indicators of mental health, as they are broad outcomes; and perceived infectability may be expected to produce small relations with irrelevant and specific indicators of mental health, as they are narrow and irrelevant outcomes. While this theoretical perspective is most often applied in the study of personnel selection, we test whether it is generalizable to perceptions and mental health.

> **Hypothesis 6:** The relation of perceived infectability and mental health when the former is measured via specific relevant indicators of mental health relative to general indicators or specific irrelevant indicators.

Two populations have been studied in research on perceived infectability and mental health: the general adult population and populations selected for specific health conditions (e.g. cancer survivors; Church et al., 2022; Sica et al., 2021). Perceived infectability likely influences mental health to some extent for the general adult population, as people have the general tendency to experience anxiety if they perceive themselves as susceptible to illness. At the same time, the relation of perceived infectability and mental health is likely stronger for those with specific health conditions. These people experience greater negative outcomes from illness, likely causing them to have much worse mental well-being if they believe that they are susceptible to these greater negative outcomes. Therefore, we suggest that the relation of perceived infectability and mental health is stronger in samples selected from populations chosen for specific health conditions than in samples selected from the general population.

> **Hypothesis 7:** The relation of perceived infectability and mental health is stronger in studies utilizing samples selected for specific conditions relative to samples taken from the general population.

Method

We primarily followed the PRISMA guidelines when conducting our meta-analysis (Page et al., 2021), but we also referenced additional widespread guides to determine our search procedures, coding procedures, and analyses (Begg and Mazumdar, 1994; Borenstein et al., 2010, 2021; Duval and Tweedie, 2000; Egger et al., 1997; Lishner, 2022; Viechtbauer and Cheung, 2010; Wiernik and Dahlke, 2020). Our meta-analytic database is provided in Supplemental Material A, which includes all effect sizes and coding decisions.

Search procedures

We underwent a structured search process to identify sources investigating the relations of perceived infectability with physical and mental health. Figure 1 presents our modified PRISMA statement. To perform our searches, we used EBSCO and Google Scholar. We chose these because they aggregate a wider range of sources compared to alternatives. EBSCO is a meta-database that returns the search results of 47 databases, including Academic Search Complete, Business Source Complete, and APA PsycInfo. By utilizing this database alone, we ensured that our searches returned a broad range of sources. Likewise, Google Scholar catalogues more gray literature than alternatives, which includes conference presentations, white papers, theses, and dissertations. Utilizing this search engine ensured that our searches returned sources less likely to appear in alternatives. Our searches in Google Scholar often returned an excessive number of results, such as 2450 sources for the search "Perceived Vulnerability to Disease" alone. We recorded the first 1,000 results of each Google Scholar search. This decision was supported by the irrelevance of sources after the first few hundred of each search, as these sources only contained search terms in reference sections.

We performed 60 searches in each of EBSCO and Google Scholar between April and July of 2025. We first performed 56 searches that included all combinations of three search portions: (1) "perceived" or "subjective," (2) "susceptibility to," "vulnerability to," "invulnerability to," "likelihood of," "threat of," "risk of," and "probability of," and (3) "illness," "infection," "disease," or "pathogens" ($2 \times 7 \times 4 = 56$). We supplemented these 56 searches with four searches, which included the search terms: "perceived infectability," "Perceived Vulnerability to Disease Questionnaire," "Contamination Cognitions Scale," and "Health Cognitions Questionnaire." Lastly, we performed forward and backward searches of prominent articles on perceived infectability (e.g. Duncan et al., 2009), resulting in an initial database of 10,317 sources.

Coding procedures

We underwent a multiple phase coding process to identify relevant sources from our initial database. For each phase of the coding process, two coders coded common sets of 20 articles at a time until their interrater agreement met standard cutoff values (e.g. Cohen's $\kappa > 0.80$). The coders then proceeded to code each source independently, conferring on any unclear coding decisions. In the first phase, we removed all duplicate sources, which reduced our database from 10,317 sources to 7898 sources. In the second phase, we coded whether each article performed an empirical investigation that measured perceived infectability. This phase reduced our database from 7898 to 661 sources. In the third phase, we coded whether each source investigated the relation of

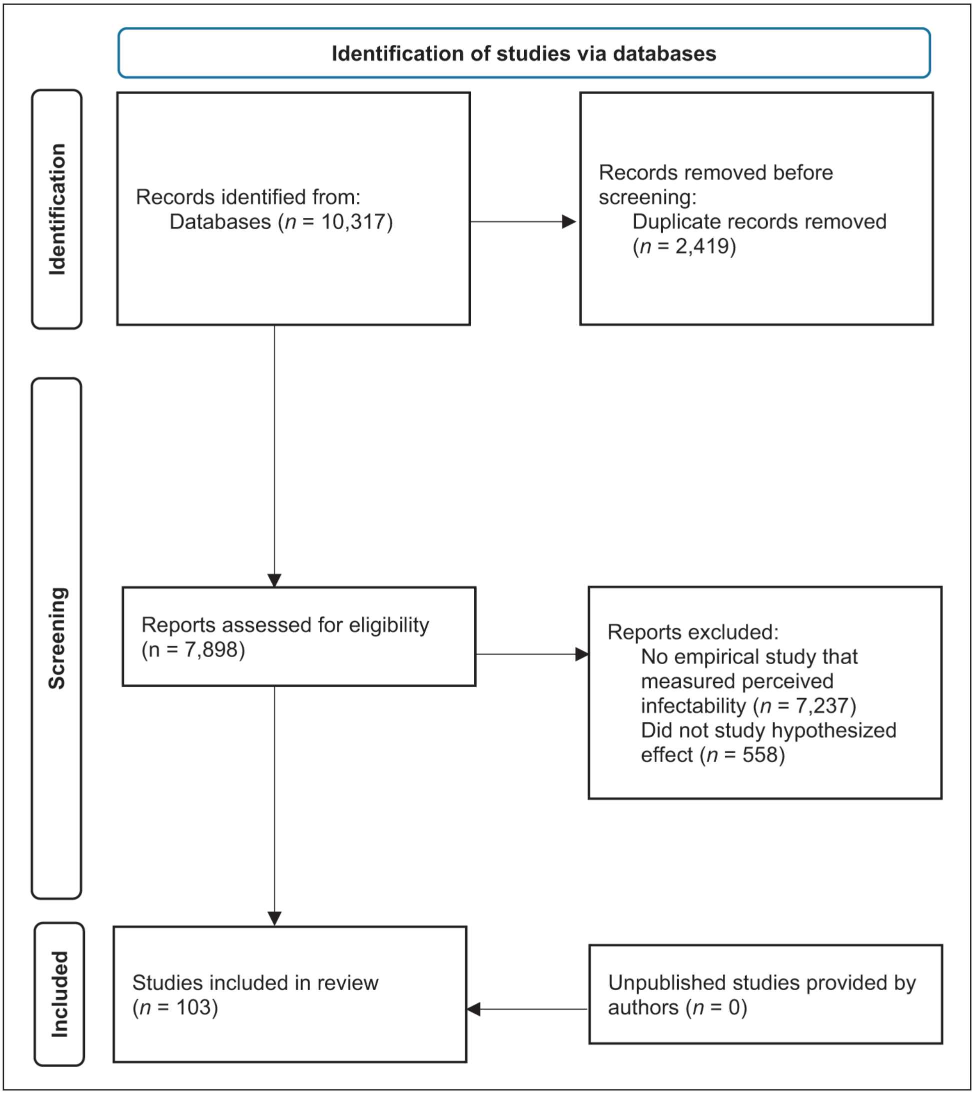

Figure 1. Modified PRISMA statement.

perceived infectability with physical or mental health, further reducing our database from 661 sources to 103 sources. We lastly contacted all primary authors of sources that empirically investigated perceived infectability for any unpublished results, but no authors provided any unpublished data regarding our relations of interest. Our final meta-analytic database included 103 sources. In addition to coding each reported effect size representing the relation of perceived infectability and physical or mental health, we also coded each of these sources and effect sizes for the characteristics described below.

Physical or mental health. We coded whether each effect represented the relation of perceived infectability with bodily well-being (physical health) or psychological well-being (mental health).[4] Supplemental Material A includes the construct labels for each effect.

Before or after COVID-19. We coded whether each article was published before the year 2020 (before COVID-19) or during and after the year 2020 (after COVID-19).[5] Because articles published in 2020 may especially include samples collected prior to COVID-19, we assessed whether alternative coding schemes impacted our results involving this variable, such as coding the year 2020 as before COVID-19 and/or not including this year altogether. Our results remained consistent regardless of the coding scheme, supporting the robustness of our findings.

Subjective or objective physical health. We coded whether each relation of physical health utilized a subjective or objective measure for the former. Subjective measures asked participants to indicate their physical well-being on a Likert scale format, whereas objective measures asked participants to indicate their current medical conditions.

Specific relevant, specific irrelevant, or general mental health. We coded whether each relation to mental health utilized a specific relevant, specific irrelevant, or general indicator of mental health. Specific relevant indicators represented aspects of mental well-being directly associated with illness, such as health anxiety. Specific irrelevant indicators represented aspects of mental well-being not associated with illness, such as social anxiety. General indicators represented broad aspects of mental well-being, such as depression.

General or special population. We coded whether each relation of mental health was calculated with a sample from a general or a special population. General samples were collected from the general population, whereas special samples were collected from a population chosen for characteristics associated with well-being, such as those with detrimental medical conditions.

Analyses

Outlier and influential case analyses

Outliers and influential cases have a disproportionate impact on meta-analytic results, causing inferences to be biased by their presence (Huffcutt and Arthur, 1995; Viechtbauer and Cheung, 2010). It is essential for researchers to perform analyses that detect outliers and influential cases, such that they can be removed from meta-analytic calculations. We calculated eight indicators of outliers and influential cases, holistically assessing whether any effect size was considered an outlier or influential case by a majority of indicators. Our results indicated that no study produced a studentized deleted residual above four, indicating that no outliers and influential cases exist in our dataset. Therefore, no studies were removed from our analyses.

Publication bias analyses

The file drawer problem is the tendency for statistically significant results to be more likely to be published, which results in statistically significant findings being more likely to be discovered via search procedures than those that are not statistically significant (Lishner, 2022). This bias may cause meta-analytic results to be systematically inflated, such that calculated effects are overestimated. For this reason, it is necessary for researchers to calculate publication bias analyses to determine the extent to which their calculated estimates may be overestimated.

We calculated three indicators of publication biases to provide robust insights into the likelihood of publication biases in our meta-analytic database. These three indicators are the trim-and-fill method, Egger's test, and Begg and Mazumdar's test with Kendall's continuity correction. The trim-and-fill method estimates the number of missing studies from either side of the meta-analytic estimate based on the relation of effect size and standard error for each imputed effect size (Duval and Tweedie, 2000). No firm guidelines exist for a statistically significant number of studies implied to be missing, but we consider five or more implied missing studies to be a large number. Further, Egger's test and Begg and Mazumdar's test also assess the relation of effect size and standard error for the imputed effect sizes, and both provide a test of statistical significance to determine whether publication biases likely exist in the meta-analytic database (Begg and Mazumdar, 1994; Egger et al., 1997; Sterne and Egger, 2005).

We also calculated fail-safe k estimates, which indicate the number of undiscovered studies that would need to be included in meta-analytic calculations to alter our interpretations (Carson et al., 1990). Large fail-safe k values indicate that the meta-analytic results are robust and unlikely to be swayed by a plausible number of undiscovered studies. Like the trim-and-fill method, no guidelines exist for a significant number of studies that would be required to notably sway results. We consider our findings to be robust if more than 20 studies would need to be discovered to notably sway results. Given the thoroughness of our search and contact procedures, it would be relatively unlikely for 20 studies on our relations of interest to remain undiscovered.

Primary analyses

We utilized a sample-size weighted, random effects meta-analytic approach to perform our primary analyses. Authors widely recommend utilizing a random rather than fixed effects approach to more appropriately account for between-study variance when estimating meta-analytic effects (Borenstein et al., 2010; Hedges and Vevea, 1998), lending support to its application. Our results are reported as meta-analytic correlation coefficients ($\overline{r}$), because most authors reported the relation of perceived infectability with physical and mental health as correlation coefficients in the articles provided within our meta-analytic database.

Further, the magnitudes of effects are tempered by the unreliability of measures, but meta-analyses can address this issue by correcting for unreliability. In the current article, we applied the artifact distribution approach to correct for unreliability. To do so, we coded the Cronbach's alpha of each measure for perceived infectability, physical health, and mental health, and we calculated the average Cronbach's alpha. The average Cronbach's alpha of perceived infectability was 0.83; the average Cronbach's alpha of physical health was 0.90; and the average Cronbach's alpha of mental health was 0.84. We then imputed the meta-analytic effect sizes and corresponding Cronbach's alphas into the formula provided by Wiernik and Dahlke (2020) to provide meta-analytic estimates corrected for unreliability ($\overline{\rho}$).

To test for potential moderating effects, we calculated random effects meta-analytic regressions. Specifically, we created dummy codes that represented the conditions of each category within our categorical moderators, and we entered these dummy codes into meta-regression analyses to assess whether they influenced the relation of physical or mental health with perceived infectability. A significant dummy code would indicate that the categorical variable is a significant influence on the relation, supporting the associated hypothesis.

Sensitivity analyses

Sensitivity analyses are the estimation of meta-analytic effects while utilizing alternative analytical approaches (Borenstein et al., 2021; Copas and Shi, 2000), and they are often recommended to ensure that any meta-analytic observations are not swayed by the analytical decisions of authors. In the current article, we averaged multiple effects from a single study together before entering them into our meta-analytic calculations. Some authors would recommend alternative approaches, as averaging effects together does not account for within-study variance (Cheung, 2015; Jak, 2015). For this reason, we also performed a three-level meta-analysis as a sensitivity analysis. Three-level meta-analyses enable the calculation of meta-analytic effects without requiring multiple effects from a single study being averaged together, enabling the analytical approach to account for both between- and within-study variance (Cheung, 2015; Jak, 2015). We report the traditional meta-analytic approach in our primary text due to its familiarity to readers, whereas we report our results utilizing this alternative approach in Supplemental Material B. Our three-level meta-analytic results were consistent with our primary analyses, and no inferences were altered between the two sets of analyses. Therefore, our sensitivity analyses

Table 1. Publication bias analyses for the relations of perceived infectibility with physical health.

Construct	No. of Sources	*k*	*n*	Fail-Safe *k*	B&M	Egger's Test β_0	Egger's Test *t*	Trim-and-Fill Left of Mean	Trim-and-Fill Right of Mean
1.) Physical Health	26	29	23,235	6230	−0.07	2.79	2.11*	0	0
2a.) Before COVID-19	12	13	4196	908	−0.24	−5.35	1.76	0	0
2b.) After COVID-19	14	16	19,039	2363	0.14	3.86	2.35*	0	0
3a.) Subjective Physical Health	15	17	9567	3549	−0.04	0.52	0.26	0	2
3b.) Objective Physical Health	15	17	14,683	740	−0.02	1.59	1.62	0	1

Note. k: number of studies; n: total sample size; $\bar{\alpha}$: average Cronbach's alpha; B&M: Kendall's τ with continuity correction from Begg and Mazumdar's rank correlation analysis; Egger's Test β_0: intercept from Egger's Test; Egger's Test t: T-statistic of slope from Egger's Test; Trim-and-Fill Left of Mean: implied studies missing from left of mean; Trim-and-Fill Right of Mean: implied studies missing from right of mean.
*$p < .05$.

supported the robustness of our present meta-analytic findings.

Results

Publication bias analyses

Tables 1 and 2 provide our publication bias analyses. For physical health, no Begg and Mazumdar's test was statistically significant, and no trim-and-fill analysis identified more than two implied missing studies. Egger's test was statistically significant for the overall relation of physical health and perceived infectability, and it was also significant for the relation of physical health and perceived infectability when restricted to studies after COVID-19. While these results suggest that publication biases are not a significant concern for the relation of physical health and perceived infectability, readers should be cognizant that publication biases may be present.

For mental health, no Begg and Mazumdar's test was statistically significant. Egger's test was statistically significant for the relation of perceived infectability and mental health when restricted to studies that measured a specific irrelevant indicator of mental health. The trim-and-fill method identified a large number of studies for the relation of perceived infectability and mental health when considering all studies together, restricted to those after COVID-19, restricted to those that measured a specific relevant indicator of mental health, restricted to those that measured a general indicator of mental health, and including those that studied samples taken from the general population. In all, the possibility of publication biases is larger for the relation of perceived infectability and mental health, and most implied missing studies from the trim-and-fill analysis were to the right of the mean. This suggests that the relation of perceived infectability and mental health is underestimated in the current analyses, and readers should interpret our results with this consideration in mind.

Primary analyses

Tables 3 and 4 provide our primary meta-analytic results. We apply the correlation benchmarks of Gómez Penedo and Flückiger (2026) to interpret our results. Based on a meta-analysis of 859 studies, they derived the following benchmarks: correlations below 0.175 are small, 0.175–0.325 are moderate, and above 0.325 are large.

Physical health. Our meta-analytic results for the relation of physical health with perceived infectability are included in Table 3. Physical health produced a negative, moderate, and statistically significant relation with perceived infectability ($\bar{r}$=−0.24, $\bar{\rho}$=−0.28, 95% C.I.[−0.30, −0.18],

Table 2. Publication bias analyses for the relations of perceived infectibility with mental health.

Construct	No. of Sources	k	n	Fail-Safe k	B&M	Egger's test β_0	Egger's test t	Trim-and-Fill Left of mean	Trim-and-Fill Right of mean
1.) Mental Health	83	94	57,377	>9999	0.02	0.48	0.68	0	19
2a.) Before COVID-19	22	25	6796	2644	0.05	−0.64	0.57	1	0
2b.) After COVID-19	61	69	50,581	>9999	0.01	0.58	0.62	0	17
3a.) Specific Relevant Mental Health	54	63	38,366	>9999	0.03	0.15	0.21	0	14
3b.) Specific Irrelevant Mental Health	8	8	4834	225	−0.11	2.00	3.02*	1	0
3c.) General Mental Health	40	43	21,938	5553	0.02	1.57	1.97	8	0
4a.) General Population	80	88	56,483	>9999	0.01	0.44	0.58	0	19
4b.) Special Population	6	6	894	65	0.00	0.34	0.11	1	0

Note. k: number of studies; n: total sample size; $\bar{\alpha}$: average Cronbach's alpha; B&M: Kendall's τ with continuity correction from Begg and Mazumdar's rank correlation analysis; Egger's Test β_0: intercept from Egger's Test; Egger's Test t: T-statistic of slope from Egger's Test; Trim-and-Fill Left of Mean: implied studies missing from left of mean; Trim-and-Fill Right of Mean: Implied studies missing from right of mean.
*$p < .05$.

$p<0.001$, $k=29$, $n=23{,}235$). Hypothesis 1 was supported. Next, we assessed whether the publication of the study before or during and after 2020 influenced observed effects. Physical health produced a negative, moderate, and statistically significant relation with perceived infectability both before ($\bar{r}$ −0.23, $\bar{\rho}=-0.27$, 95% C.I. [−0.35, −0.12], $p<0.001$, $k=13$, $n=4196$) as well as during, and after 2020 ($\bar{r}=-0.24$, $\bar{\rho}=-0.28$, 95% C.I. [−0.31, −0.17], $p<0.001$, $k=16$, $n=19{,}039$), and the dummy code in a meta-regression comparing the magnitude of these effects was not statistically significant ($\beta=-0.00$, *S.E.*$=0.06$, 95% C.I.[−0.13, 0.12], $p=0.95$). This relation did not differ before or during and after 2020, and Hypothesis 2 was not supported. Lastly, we tested whether the measurement of physical health as a subjective or objective indicator influenced the observed effects. Physical health produced a negative, moderate, and statistically significant relation with perceived infectability when measured subjectively ($\bar{r}=-0.31$, $\bar{\rho}=-0.36$, 95% C.I. [−0.38, −0.24], $p<0.001$, $k=17$, $n=9567$), but it produced a negative, small, and statistically significant relation with perceived infectability when measured objectively ($\bar{r}=-0.16$, $\bar{\rho}=-0.19$, 95% C.I. [−0.22, −0.10], $p<0.001$, $k=17$, $n=14{,}683$). The dummy code within a meta-regression comparing the magnitude of these effects was statistically significant ($\beta=-0.18$, *S.E.*$=0.06$, 95% C.I. [0.06, 0.30], $p=0.004$), indicating that the relation of physical health and perceived infectability does differ based on whether the former is measured subjectively or objectively. Hypothesis 3 was supported.

Mental health. Our primary meta-analytic results for the relation of mental health with perceived infectability are included in Table 4. Perceived infectability produced a negative, moderate, and statistically significant relation with mental health ($\bar{r}=-0.25$, $\bar{\rho}=-0.30$, 95% C.I. [−0.28, −0.22], $p<0.001$, $k=94$, $n=57{,}377$). Hypothesis 4 was supported. We then assessed whether the publication of the study before or during and after 2020 influenced the observed effects. Physical Perceived infectability

Table 3. Relations of perceived infectibility with physical health.

Construct	No. of Sources	k	n	r	ρ	95% C.I.	z-Value	p-Value	I^2
1.) Physical Health	26	29	23,235	−0.24	−0.28	−0.30, −0.18	7.47	<0.001	94.87
2a.) Before COVID-19	12	13	4196	−0.23	−0.27	−0.35, −0.12	3.82	<0.001	93.51
2b.) After COVID-19	14	16	19,039	−0.24	−0.28	−0.31, −0.17	6.46	<0.001	94.94
3a.) Subjective Physical Health	15	17	9567	−0.31	−0.36	−0.38, −0.24	8.45	<0.001	91.78
3b.) Objective Physical Health	15	17	14,683	−0.16	−0.19	−0.22, −0.10	4.94	<0.001	87.71

Note. k: Number of studies; n: total sample size; $\overline{r}$: sample-size weighted random effect average correlation coefficient; $\overline{\rho}$: sample-size weighted random effect average correlation coefficient corrected for unreliability; 95% C.I.: 95% Confidence interval of the sample-size weighted random effect average correlation coefficient; z-value: *Z*-value of the sample-size weighted random effect average correlation coefficient; *p*-value: *p*-value of the ample-size weighted random effect average correlation coefficient.

Table 4. Relations of perceived infectibility with mental health.

Construct	No. of Sources	k	n	r	ρ	95% C.I.	z-Value	p-Value	I^2
1.) Mental Health	83	94	57,377	−0.25	−0.30	−0.28, −0.22	16.08	<0.001	92.28
2a.) Before COVID-19	22	25	6796	−0.26	−0.31	−0.31, −0.21	9.11	<0.001	79.75
2b.) After COVID-19	61	69	50,581	−0.25	−0.30	−0.29, −0.22	13.60	<0.001	93.71
3a.) Specific Relevant Mental Health	54	63	38,366	−0.31	−0.37	−0.34, −0.28	19.36	<0.001	88.71
3b.) Specific Irrelevant Mental Health	8	8	4834	−0.19	−0.23	−0.24, −0.14	6.92	<0.001	54.09
3c.) General Mental Health	40	43	21,938	−0.19	−0.23	−0.23, −0.15	8.85	<0.001	87.64
4a.) General Population	80	88	56,483	−0.25	−0.30	−0.28, −0.22	15.41	<0.001	92.72
4b.) Special Population	6	6	894	−0.29	−0.34	−0.36, −0.21	6.74	<0.001	38.00

Note. k: number of studies; n: total sample size; $\overline{r}$: sample-size weighted random effect average correlation coefficient; $\overline{\rho}$: sample-size weighted random effect average correlation coefficient corrected for unreliability; 95% C.I.: 95% Confidence interval of the sample-size weighted random effect average correlation coefficient; z-value: Z-value of the sample-size weighted random effect average correlation coefficient; *p*-value: *p*-value of the ample-size weighted random effect average correlation coefficient.

produced a negative, moderate, and statistically significant relation with mental health both before ($\overline{r}=-0.26$, $\overline{\rho}=-0.31$, 95% C.I. [−0.31, −0.21], $p<0.001$, $k=25$, $n=6796$) as well as during and after 2020 ($\overline{r}=-0.25$, $\overline{\rho}=-0.30$, 95% C.I.[−0.29, −0.22], $p<0.001$, $k=69$, $n=50{,}581$), and the dummy code within a meta-regression comparing the magnitude of these effects was not statistically significant ($\beta=0.01$, $S.E.=0.04$, 95% C.I. [−0.06, 0.08], $p=0.78$). This relation did not differ before or during and after 2020, and Hypothesis 5 was not supported.

Also, we tested whether the type of mental health indicator affected the studied relation, with the types being categorized as specific relevant, specific irrelevant, or general mental health. Mental health produced a negative, moderate, and statistically significant relation with perceived infectability when measured with a specific relevant indicator ($\overline{r}=-0.31$, $\overline{\rho}=-0.37$, 95% C.I. [−0.34, −0.28], $p<0.001$, $k=63$, $n=38{,}366$), whereas it produced a smaller but still negative, moderate, and statistically significant relation with perceived infectability when measured with a specific irrelevant ($\overline{r}=-0.19$,

$\bar{\rho}=-0.23$, 95% C.I. [−0.23, −0.15], $p<0.001$, $k=43$, $n=21{,}938$) or general ($\bar{r}=-0.19$, $\bar{\rho}=-0.23$, 95% C.I. [−0.23, −0.15], $p<0.001$, $k=8$, $n=4834$) mental health indicator. The dummy code within a meta-regression indicated that the comparison of specific relevant and general mental health outcomes ($\beta=0.18$, $S.E.=0.03$, 95% C.I. [0.12, 0.24], $p<0.001$) was statistically significant, indicating that this relation differs based on the operationalization of mental health.[6] Hypothesis 6 was supported. Lastly, we tested whether the chosen population influenced this studied relation. The relation of mental health and perceived infectability was negative, moderate, and statistically significant whether the sample was drawn from a general population ($\bar{r}=-0.25$, $\bar{\rho}=-0.30$, 95% C.I. [−0.28, −0.22], $p<0.001$, $k=88$, $n=56{,}483$) or a special population ($\bar{r}=-0.29$, $\bar{\rho}=-0.34$, 95% C.I. [−0.36, −0.21], $p<0.001$, $k=6$, $n=894$), and the dummy code in an associated meta-regression was not statistically significant ($\beta=0.04$, $S.E.=0.07$, 95% C.I. [−0.10, 0.17], $p=0.59$). Hypothesis 7 was not supported.

Discussion

Perceived infectability is important for understanding both physical and mental health, which is reflected in its presence within many associated models and theories (Makhanova et al., 2022; Safra et al., 2021; Whelan and Hingston, 2024). In the current literature, no quantitative review summarizes these relations, causing the variability in observations to potentially bias the development of relevant models and theories. Due to this tension, the current investigation reports a meta-analysis of the relations between perceived infectability and physical and mental health, addressing these concerns within the literature. From starting with a list of over 10,000 potential sources, we estimated our effects from a final list of 103 sources.

Our results produced several notable insights. Perceived infectability produced a negative, moderate, and statistically significant relation with both physical health and mental health, supporting its placement in extant models, and theories (Airoldi et al., 2022; Bailey and Wells, 2016; Ding and Luo, 2022; Makhanova et al., 2022). Our results also demonstrated that neither of these relations produced stronger effects during and after 2020 relative to before 2020, indicating that the COVID-19 pandemic had no significant impact on these relations. This result suggests that the COVID-19 pandemic did not significantly alter how people perceive their perceived infectability relative to their physical health, and it also indicates that mental well-being did not become more influenced by perceptions of vulnerability. At the same time, both relations were influenced by the operationalizations of the outcomes. Self-reported indicators of physical health produced stronger relations with perceived infectability than objective indicators, and specific and relevant indicators of mental well-being produced stronger relations with perceived infectability than general or specific and irrelevant indicators. Researchers must remain mindful of these differences in anticipating the magnitude of their effects. Lastly, the relation of perceived infectability and mental health was not influenced by the study population, whether it was a general adult population or a population specifically chosen for a characteristic of health. These results together provide several notable implications for research and practice.

Theoretical implications and future research directions

Behavioral immune system theory. The behavioral immune system framework asserts that humans protect themselves from infectious disease through a series of cognitive and emotional processes (Duncan et al., 2009; Howard et al., 2026; Schaller and Park, 2011). More specifically, the behavioral immune system motivates humans to avoid exposure to infectious pathogens, thereby acting as a protective psychological mechanism. Our findings suggest that individuals with poorer physical health are more likely to perceive themselves at risk of infection, which may serve as a compensation mechanism to provide greater immune protection. These people may be more avoidant of infectious pathogens due to their heightened perceived infectability, causing them to compensate for their poor physical health. Further, subjective evaluations of physical health were more strongly related to perceived infectability than objective evaluations. This finding is particularly meaningful given the global difficulty of access to healthcare (Kinfu et al., 2018). Although a significant portion of the global population may not be objectively aware of their physical health status, our findings support that humans adaptively respond to disease risk based on heightened awareness of physical health cues. In turn, this finding provides further support for the behavioral immune system framework. Because the triggered avoidance processes are cognitive and emotional in nature, perceptual evaluations of health produce stronger effects on perceived infectability than objective evaluations due to their conceptual proximity.

It should be recognized that physical well-being and perceived infectability were related, but their relation was not strong enough to consider the two constructs as one and the same. For this reason, these two constructs must be recognized to incur differing theoretical implications and positioning in the behavioral immune system. For instance, it is likely that physical health relates to both actual infectability and perceived infectability, wherein both types of infectability may be associated with differing chains of causality that lead to behavioral avoidance of infectious pathogens (Duncan et al., 2009; Shook et al., 2020; Tybur et al., 2014). Future researchers should build upon our meta-analytic results to perform more nuanced studies that test specific explanatory mechanisms between physical health and perceived infectability. Because the behavioral immune system is intertwined with emotional processes, it is possible that negatively valenced emotions mediate this relation, wherein people develop their perceptions of vulnerability to illness from their implicit emotional states. By testing these relations, more complete depictions could be obtained of the behavioral immune system.

Furthermore, these emotional mechanisms may be key in future research probing the relations of perceived infectability, physical health, and mental health together. While causal effects cannot be firmly supported with our meta-analytic data, our results nevertheless indicate that those with greater perceived infectability possess worse mental health. The behavioral immune system may indeed compensate for those with weaker biological immune systems, but those who perceive themselves as having weaker biological immune systems may habitually experience negative emotions from their perceived infectability. Despite any benefits, these compensation mechanisms may not result in balances to mental well-being. Therefore, the behavioral immune system may serve little protective functions for mental health, if not producing a negative impact on mental health. At the same time, future research is needed to assess this notion, and researchers should test whether perceived infectability and potential emotional candidates serve as mediators between physical well-being and mental well-being.

Alternatively, reciprocal relationships between physical and mental health have been well established (Doherty and Gaughran, 2014; Ohrnberger et al., 2017; Roberts, 2017); those with mental health conditions are more likely to develop and experience physical health issues, and those with chronic physical health issues are more likely to experience adverse mental health outcomes. Perceived vulnerability to illness may also be a key mechanism explaining why those with poor mental health also subsequently experience poor physical health outcomes. Because our findings are correlational, future research should assess reverse causality in these relations. Refining our understanding of the causal and directional nature of these relationships is key to the continuous improvement of more holistic treatment approaches (i.e. treatment approaches that recognize the complex nature of the relationship between mental health and physical health).

Perceived infectability, COVID-19, and vulnerable populations. We consistently demonstrated that the publication dates of our sources in relation to the COVID-19 pandemic did not influence our tested relations, as a significant moderating effect was not found on the relation of perceived infectability with either physical or mental health. This finding suggests that, while certainly influential on perceptions of physical health and mental health altogether, the COVID-19 pandemic did not cause people to reevaluate the nature of perceived infectability. Instead, this result suggests the influence of perceived infectability on well-being remained consistent during and after the COVID-19 pandemic. It should be recognized, however, that these suggestions derived from our meta-analytic observations cannot be stated with certainty. The coding of sources' publication dates to assess moderating effects via meta-analysis is a standard practice, and it is among the few approaches to provide broad inferences into longitudinal changes in relations across years; however, the publication dates of sources do not perfectly correspond to when data was collected, introducing some error into our analyses. Therefore, readers should interpret our results with this caveat in mind.

Additionally, our results found that perceived infectability did not produce stronger relations with mental health for participants selected for specific health conditions relative to the general population. This finding indicates that people with certain health conditions are impacted similarly by their perceived infectability to the general population, and relevant models and theories developed with participants from the general population may generalize to those with specific health conditions. Therefore, our results may encourage the broader application of theory to special populations.

Further, our hypotheses were presented independently, but they may provide insights into a common phenomenon. Our theoretical rationale suggested that people at heightened risk for infection or who experience greater severity from infection would be more reactive regarding perceived infectability, whether it is their perceived infectability being more impacted by their physical health or having a greater impact on mental health. This theoretical rationale was consistent whether the heightened risk was due to COVID-19 or a health condition specific to the participant. As neither effect was statistically significant, our findings suggest that perceived infectability is no more reactive for those at a particular risk or threat of infection, and instead, people may generally experience similar effects regarding perceived infectability. Using our findings as a guide, future researchers should further explore this notion. Researchers should test models of moderated mediation, such that they can determine whether the broader causal chain of relations associated with perceived infectability is consistent across populations. While the current article provided significant support for the consistency of bivariate relations, these future investigations can provide insights into broader models and theories.

Methodological considerations. Our findings also provide several notable insights about methodological considerations that significantly influence research on perceived infectability. Researchers rarely differentiate subjective and objective evaluations of physical health when studying perceived infectivity. Instead, similar theoretical rationales are applied, and similar expectations are provided regarding the magnitude of these relations. By showing that the relation of physical health and perceived infectability differs based on the operationalization of the former, our findings indicate that researchers should specify their measurement approach when developing their theoretical rationale and hypotheses. That is, researchers should directly acknowledge whether their indicators of physical health are subjective or objective, and they should develop hypotheses that reflect the expected magnitudes associated with these outcomes (such as those shown in our meta-analysis). By doing so, researchers could develop more specific hypotheses, significantly advancing the literature on physical health and perceived infectability. Similarly, researchers can now move beyond dichotomous hypotheses regarding this relation (i.e. significant or not significant), and they can instead provide hypotheses regarding specific magnitudes of effects. By doing so, they could adhere to the calls of researchers across many domains of study (Hopkins, 2022; Murphy and Myors, 1999; Newman, 2008).

Our findings also indicated that the bandwidth-fidelity dilemma can generalize to the study of perceived infectability and mental health. This perspective argues that narrow constructs produce stronger relations with relevant outcomes than broad constructs, but broad constructs produce moderate relations with a wider range of outcomes (Hogan and Roberts, 1996; Salgado, 2017). We supported that this effect also occurs for perceived infectability and indicators of mental health categorized as either narrow and relevant, narrow and irrelevant, and general. By doing so, we provide significant evidence that future researchers must consider the bandwidth-fidelity dilemma when testing their hypotheses and models, including the relation of perceived infectability and mental health. For example, researchers should not assume or propose that perceived infectability will produce similar relations with anxiety and health anxiety, as the latter is now recognized to produce stronger relations than the former. Therefore, by providing this support, the current investigation identifies a novel theoretical perspective that should be integrated with a wide scope of future research on perceived infectability.

We performed a focused meta-analysis on perceived infectability rather than aggregating the construct with germ aversion, ensuring that our observations do not suffer from construct contamination. This enables our results to directly speak to the nomological network for perceptions of vulnerability to illness, and we encourage future authors to perform similar endeavors. We call for future studies that investigate perceived infectability and/or germ aversion separately, due to their likely differing position in the behavioral immune system and other relevant theoretical perspectives.

Practical implications

Our meta-analytic findings also offer significant practical applications for both health and clinical psychology domains. Namely, our results may alter the implementation of strategic messaging related to health prevention. Rather than utilizing objective data for public health messaging to promote a change in health-related attitudes, intentions, or behaviors, public health campaigns could focus more on messaging to address subjective perceptions of physical health, given that subjective evaluations produced stronger relations than objective evaluations.

Our results may also influence how clinicians understand and communicate with patients, as they recognize the value of patients' subjective experiences of their physical health in impacting their perception of vulnerability to illness. Although a patient's standardized medical testing results may fall within normal ranges, their perceived vulnerability to illness may still be elevated. Normal testing results may not reflect the subjective evaluation of patient experiences. For instance, many patients experience significant life-altering symptoms that impact their subjective experiences of physical health, which may not be reflected on standardized testing instruments. This is often the case with "invisible illnesses," such as illnesses characterized by immune system dysfunction, which can take decades to accurately diagnose (e.g. Chapel et al., 2008). As such, clinicians who acknowledge and validate patients' subjective experiences have a greater chance at gaining patient trust and developing effective communication channels.

Limitations and future research directions

The current investigation shares the same limitations as other meta-analyses, but we underwent several steps to alleviate these concerns. Meta-analyses require systematic search procedures to identify a set of potential sources. We included a multitude of relevant search terms, and we searched two meta-databases. We also performed forward-and-backwards searches and contacted authors for unpublished studies. From these procedures, we obtained a list of over 10,000 potential sources, which produced a final list of 103 sources. These figures are larger than other meta-analyses on similar topics (Cheng et al., 2022;

Howard and Siefert, 2025; Pizzol et al., 2023), supporting the thoroughness of our search procedures. Nevertheless, future researchers may seek to replicate our current results with alternative search procedures to ensure that all relevant sources are found. While our fail-safe k values suggest that our results would be consistent, replication efforts are always essential to ensure accurate interpretations.

We underwent standard procedures to code our sources, providing appropriate indicators of interrater reliability (Borenstein et al., 2010, 2021). By utilizing these approaches, we ensure that our results were not biased by idiosyncratic coding decisions. Despite these assurances, future researchers may wish to replicate our results with alternative coding approaches. Supplemental Material A provides our meta-analytic database, such that any future researchers can choose to recode our included studies and reconduct our analyses. While we believe that any results would remain consistent, replication efforts are certainly important.

Similarly, we coded a wide array of indicators for physical and mental health. Most of these were indicators of poor physical and mental health, such as stress, depression, and anxiety. Our coders were largely consistent in the interpretation of included effects, and the coders conferred regarding any disagreements. Again, future researchers may wish to reanalyze our results utilizing alternative coding schemes, and they can choose to recode our meta-analytic database provided in Supplemental Material A. It is believed that all results would be consistent with alternative coders, but any replication efforts would further strengthen the present work.

As mentioned above, we investigated multiple coding schemes for assessing whether the relations of perceived infectability with physical and mental health differ before and after COVID-19. None of these coding schemes produced notably different results, indicating that these relations did not differ before or after COVID-19, no matter how time was coded. Future researchers may wish to reinvestigate this relation after more time has passed. While we believe that any effects of COVID-19 would weaken over time, it is possible that the publication of additional studies may produce differing results. Therefore, future researchers should reinvestigate these effects when additional studies are available for inclusion.

Lastly, meta-analyses are bound by the extant literature. Our theoretical rationale proposed directional relations between our constructs of interest, but not enough studies have utilized robust research designs that can provide strong insights into causal effects. For this reason, our meta-analysis likewise could not provide causal inferences. Future researchers should reassess our studied relations with more advanced research designs that can provide causal insights, such as panel designs. By doing so, stronger tests of theory can be produced, enabling future researchers to have greater confidence in their applications of these theories.

Conclusion

To fully understand the occurrence and effects of physical and mental health, it is necessary to accurately model their relations with perceived infectability, given its relevance to associated models, and theories. Our results supported that perceived infectability indeed produces consistent relations with physical and mental health, which were not influenced by the studied sample or year of data collection relative to the COVID-19 pandemic. These relations were affected by the applied measure for physical and mental health, and researchers must account for their operationalization when interpreting the nature of their results. Therefore, the current article supports the future investigation of perceived infectability with physical and mental health, while explaining certain causes for the variability of results seen in the literature.

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Ethical considerations

Ethics approval was not required for this review article as no data were collected from participants.

Consent to participate

Consent to participate is not applicable to this review article as no data were collected from participants.

Consent for publication

Consent for publication is not applicable to this review article as no identifiable participant data are included.

Author contributions

All three authors were involved in the writing of the manuscript and coding of articles. Dr. Matt C. Howard is responsible for all analyses.

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Data availability statement

All data is provided as Supplemental Material A.

Supplemental material

Supplemental material for this article is available online.

Notes

1. Our applied theoretical rationale proposes that physical well-being impacts perceived infectability; however, not enough existing studies have studied this relation with robust methodological designs to provide firm causal inferences via the meta-analytic methodology. For this reason, we test a non-directional hypothesis.
2. It should be recognized that other moderators are likely to have a significant influence on the relations of perceived infectability, especially for members of specific populations. For instance, existing mental health concerns could exacerbate any detrimental effects of perceived infectability. We study the effects of the COVID-19 pandemic due to its potential moderating influence and broad theoretical relevance, as most members of the general population experienced significant psychological effects during this period; however, future researchers should explore other moderating effects, including those that may be particularly important for specific subpopulations, and we recommend specific directions for future research on moderators in our discussion section.
3. Like Hypothesis 1, our theoretical rationale proposes that perceived infectability impacts mental well-being, but we propose a non-directional hypothesis. This is again because not enough extant studies investigated the relation of perceived infectability and mental well-being using research designs that can robustly assess causal effects, preventing the current meta-analysis from providing any causal insights.
4. Most studies investigated the relation of perceived infectability with indicators of poor physical and mental health, such as stress, depression, and anxiety. We report our results as the relations of perceived infectability with physical and mental health due to the ease of interpretation, but it should be recognized that our results were primarily estimated from negative indicators of these outcomes.
5. We underwent several steps to ensure the accuracy of coding for year, as it is more important to identify the timeframe that the data was collected than the publication date. We first reviewed each source for data collection dates, and we checked the timestamps of any accessible data. Very few articles reported this information, and the relation of this information the COVID-19 pandemic (i.e. before or after) was consistent with the publication year. Therefore, our results are consistent whether this alternative information is utilized or not.
6. No study investigated the relation of perceived infectability with irrelevant specific indicators of mental health alone. For this reason, comparisons could not be made with specific irrelevant indicators due to the complete overlapping of represented studies in the meta-analytic estimates between the operationalizations.

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